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EXAMINER	
THOMAS, MIA M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/531,332	MCPHEELY ET AL.	
	Examiner	Art Unit	
	Mia M. Thomas	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There are two errors described here at Claim 1, "prescribed errors" and "other errors". It is unclear as to which "said errors" at claim 1, line 5, the applicant is referring to. Which errors are to be reliant on for antecedent basis concerns where "said error" is described throughout the claim, for example at page 36, line 9.

Also, are there two cameras at Claim 1? It is unclear, that when read in light of the specification, there is only one camera continuously streaming the pre/post event video(s). What facilitates before and after the trigger signal if there is only one camera associated with the machine sensor in this claim.

3. Claim 1 recites the limitation ""display monitor" at line 8, page 36. There is insufficient antecedent basis for this limitation in the claim. It appears that when read in light of the specification, applicant is referring to the "computer processor" that may house a display monitor. This will be assumed for examination purposes.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1, 2, 8-10, 12-15, 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Iida et al. (US 6,798,928 B2).

Regarding Claim 1: Iida discloses A digital diagnostic video system for diagnosing malfunctions and other errors in the operation of manufacturing machinery, said machinery having a plurality of machine sensors located at monitoring zones for detecting prescribed errors and causing sensor signals to be generated upon occurrence of said errors ("It is an object of the present invention to provide an image recording apparatus which makes it possible to connect and store related data (image data, inspection data corresponding to inspection results) for identifying the cause of the generation of nonconforming products." at column 2, line 15-19), said system comprising:

a video camera associated (Refer to Figure 2, numeral 10) with a machine sensor (Refer to Figure 2, numeral 11) located at a monitoring zone for producing real-time video output of the machinery operation desired to be monitored by said camera and sensor

a central control unit (Refer to Figure 2, numeral 12) having a computer processor (Refer to Figure 2, numeral 16) continuously receiving the video output from said camera during normal machinery operation;

a temporary computer memory in communication with said processor continuously storing said video output in real time (Refer to Figure 3, numeral 12h);

said processor in communication with said sensor for receiving said sensor signal to provide a trigger signal when said sensor signal is associated with a prescribed trigger event (Refer to Figure 3, numeral 12j-"Communication Interface");

a permanent memory for storing a pre-event video including a first preset length of the video output depicting machinery operation occurring immediately before said trigger signal and storing a post-event video of a second preset length of the video output depicting machinery operation occurring immediately after said trigger signal (Refer to Figure 3, numeral 12c);

a computer program having a set of operating instructions embodied in computer readable code executable by said processor to control the recording and storing of said pre-event and post-event videos, said program including capture instructions for copying at least said pre-event video from said temporary memory into said permanent memory in response to said trigger

signal, recording said post-event video in response to said trigger signal, and saving said post-event video in said permanent memory along with said pre-event video to provide a trigger event video; whereby said trigger event video may be displayed on said display monitor and replayed to assist in diagnosing said trigger events and errors ("While making suitable use of a main memory 12c, this CPU 12a carries out prescribed processes and the like related to the present invention based on process programs, parameters and the like stored in a ROM 12b. In this regard, the actual process method will be described below. Further, the ROM 12b is constructed from a nonvolatile memory such as a EPROM, DTPROM or the like." at column 4, line 60).

Regarding Claim 2: Iida discloses wherein said central control unit (Refer to Figure 2, numeral 12) includes a display monitor associated with said processor (Refer to Figure 2, numeral 15, coupled to numeral 12) having a display screen for continuously displaying said video output during machinery operation (Refer to Figure 13 for the display screen vide output).

Regarding Claim 8. The system of claim 1 wherein said operating instructions include instructions for storing said post-event video real time in said temporary memory containing said pre-event video in response to said trigger signal ("Furthermore, the image recording apparatus 12 is also equipped with a storage device 12h which is a nonvolatile memory for storing recorded data and a portion of the system program..." at column 5, line 38), and copying said pre-event and post-event videos into a video file in said permanent memory ("The user software associated with Figure 2, numeral 16 includes instructions for transmitting or copying the pre/post event videos to permanent memory Figure 3, numeral 12c-"Main Memory").

Regarding Claim 9: Iida discloses [wherein said] operating instructions include display instructions for displaying said trigger event video in response to a view request input on said display monitor so that the machine operation before and after the trigger event may be studied for diagnostic purposes ("...the image recording apparatus includes a display means, wherein a timing chart showing at least the timing of the acquired fields is displayed by the display means based on data stored in the temporary storage portion..." at column 2, line 65).

Regarding Claim 10: Iida discloses [wherein said] operating instructions include report instructions embodied in computer readable code for creating a video data file including said pre-event video and said post-event video, along with a time and, date, for said trigger event ("In order to overcome this problem, a system has been developed in which a time stamp is added to each outputted data ("pre/post event data"), and based on such time stamps at the time the outputs are played back, the system recognizes the time when each data was generated, and by carrying out control to match such data synchronization can be carried out." at column 1, line 65).

Regarding Claim 12: Iida discloses [wherein said] operating instructions include instructions for (1) continuously receiving a video of the machinery operation in real time ("Accordingly, the digital converted image data received from the video interface 12e is compressed and then sent to the CPU 12a." at column 5, line 20),

(2) continuously storing video in a temporary memory in real time (Refer to Figure 3, numeral 12h; "Now, in case where a new recording execution event occurs while data is being stored in the storage means, it is possible to omit the recording of the image data and store only the inspection data." at column 2, line 59),

(3) continuously displaying the video on a display screen in real time (Refer to Figure 3, numeral 15),

(4) continuously receiving available sensor signals ("Further, the prescribed signal sent from the inspection device is a characteristic signal of the inspection device which forms a reference signal, and in the embodiments of the present invention, this signal is a GATE signal, but it is also possible to use the step signal which forms the source of the GATE signal. Of course, other signals may be used so long as they can form a reference for obtaining relative position data." at column 2, line 44),

(5) processing said sensor signals to determine if said trigger event has occurred ("...in the visual sensor 11, a prescribed image recognition process is carried out on the image data of the imaged article 2 to judge whether a defect is present or absent..." at column 4, line 9), and

(6) continuing instructions (1) through (5) if a trigger event has not occurred (Refer to the execution performed at Figure 5).

Regarding Claim 13: Iida discloses [wherein said] operating instructions include instructions for generating said trigger signal and recording the time and date of the trigger event upon occurrence of said trigger signal ("...a system has been developed in which a time stamp is added to each outputted data, and based on such time stamps at the time the outputs are played back, the system recognizes the time when each data was generated..." at column 1, line 65);

storing said video output according to a first preset duration for said pre-event video and a second preset duration for said post-event video upon occurrence of said trigger signal (Refer to Figure 3, numeral 13 connected to numeral 12h via the serial port bus as shown);

copying video from said temporary memory into said permanent memory of said first preset duration to provide said pre-event video upon the occurrence of said trigger signal (Refer to Figure 8); beginning the recording of said post-event video upon occurrence of said trigger signal (Refer to Figure 8- "Recording Execution Event"),
and storing said post-event video in said permanent memory after said second preset duration has expired (Refer to the process steps of Figure 9, then store the video at Figure 3, numeral 12c).

Regarding Claim 14: Iida discloses wherein said operating instructions include instructions for storing said post-event video real time in said temporary memory containing said pre-event video in response to said trigger signal and copying said pre-event and post-event videos into a video file in said permanent memory (Refer to Figure 3, numeral 12j; The operating instructions further may be manipulated or suggested by the use of instructions facilitated by a user at numeral 16 (Figure 3) and further as shown by way of example at Figure 9 and 12).

Regarding Claim 15: Iida discloses wherein said operating instructions include instructions for storing said pre-event and post-event video from said permanent memory in a data file along with text representing said time, date, and a trigger name identifying location of the trigger event so that video before and after the trigger event and text information can be selected and displayed to assist in the diagnosis of the trigger event (Refer to Figure 3, numeral 12j; The operating instructions further may be manipulated or suggested by the use of instructions facilitated by a user at numeral 16 (Figure 3) and further as shown by way of example at Figure 13).

Regarding Claim 17: Iida discloses including a machine control and data analysis system for monitoring the production performance of the operating machinery such as down time, speed, production, and alarm signals ("...wherein a judgment of quality is carried out for each local region." at column 4, line 19); and said control and data analysis system being in communication with said processor of the digital diagnostic system for displaying information from said video file along with performance data (Refer to Figure 1, Measurement Data (RS-232C), by way of illustration.).

6. Claims 28-37 are rejected under 35 U.S.C. 102(e) as being anticipated by Wolff et al. (US 7,305,114 B2).

Regarding Claim 28: Wolff discloses a computerized method for diagnosing errors in manufacturing processes implemented by operating machinery (Refer to Figure 2) having machine sensors for sensing operational errors (Refer to Figure 2, numeral 220), and a machine controller for controlling the machinery operation in response to the sensor signals (Refer to Figure 2, numeral 230), said method comprising:

sensing machinery operation malfunction and other errors and generating sensor signals representing the errors (Refer to Figure 2; "transmitting strobe signals 242");

pre-defining triggers signals based on said sensor signals for controlling real time storage of video output from one or more video cameras (Refer to Figure 2, numeral 244);

executing computer readable instructions embodied in a computer readable medium on a computer processor (Refer to Figure 3, numeral 400-"MVS Software") including:

continuously storing said video output in temporary memory in real time; displaying said input from video cameras on a display screen in real time (Refer to Figure 3, numeral 286);

communicating sensor signals from the machinery controller to said computer processor (Refer to Figure 3-"I/O Interface");

recording date and time, identification of the sensors generating said sensor signal ("The display can be used to show real time and stored images 132 of the object 108, and text or GUI control buttons by which the image can be analyzed or manipulated. A variety of other machine vision functions and tools can also be provided, all of which are part of a generalized machine vision application 140, stored on disk, and loaded as needed by the system." at column 1, line 61);

processing the sensor signals and generating a trigger signal in response by one or more sensor signals (Refer to Figure 3, numeral 280);

representing a pre-defined trigger event (Refer to Figure 2, numeral 222-"Communication Software Component");

storing said video output stored in temporary memory into permanent memory upon occurrence of said video signal (With reference to Figure 3; Storage is moved from element 286 into the main storage at element 282 upon the occurrence of video signal via the I/O Interface 234);

creating a trigger video file containing said date, time, and identification of said trigger event; and saving said video in a computer readable medium ("The processor, accordingly includes an application that supports transmission and receipt of data in a desired portable-device compatible format and speed including a Transport Control Protocol/Internet Protocol (TCP/IP) format for web browser viewing and a PDA data-transmission format recognized by the PDA." at column 4, line 41).

Regarding Claim 29: Wolff discloses [including] storing a first preset amount of said video output as a pre-event video depicting machinery operation occurring before the trigger signal and storing a video output as a post-event video depicting the machinery after occurrence of the trigger signal (Refer to Figure 2, numeral 222; The Communication Interface Software will perform the user defined preset amounts of video output as related to the pre/post event video. "A user chooses appropriate operating parameters that specify such things as how images are to be acquired, the machine vision operations to be performed, the acceptance criteria, and how the results are to be communicated. Configuration requires a mechanism for a user to enter numeric, Boolean, enumerated, text string, and other parameters, and communicate such parameters to the MVS." at column 2, line 42).

Regarding Claim 30: Wolff discloses [including] storing said pre-event video in temporary memory immediately upon occurrence of said trigger signal currently with beginning storage of said post-event video in said temporary memory (Refer to the Serial Bus Port at Figure 3, where the pre-event video is immediately sent to memory, 282, specifically, 286 without any delay, to further expedite processing), and saving said pre-event and post-event videos in a video file in permanent computer memory (Refer to Figure 3, numeral 284).

Regarding Claim 31: Wolff discloses [including]

providing a computer processor having computer readable medium containing said permanent memory ("According to the embodiments described herein, the interface is assumed to provide a communications bandwidth as low as around 10,000 bytes/second. The PDA includes a processor typically capable of completing approximately around 4 million instructions/second (4

MIPS)... "erasable programmable read-only memory (EPROM) for long-term storage of application information and configuration information." at column 6, line 61),

and a temporary computer memory in communication with said computer readable medium (Refer to Figure 3, numeral 286); wherein said method includes the steps of

allocating portions of said temporary memory for storing video output from said video cameras to define preselected memory amounts for said pre-event and post-event videos in temporary memory (Refer to Figure 3, numeral 222, specifically, numeral 400);

and storing said pre-event and post-event videos in said pre-selected memory amounts for said video cameras upon occurrence of trigger signals associated with said cameras (Refer to figure 3, numeral 282).

Regarding Claim 32: Wolff discloses [including]

set up instructions for receiving an input selection to preset the allocation of said pre-event video and said post-event video in said pre-selected memory amounts (Refer to Figure 3, numeral 222, specifically numeral 400).

Regarding Claim 33: Wolff discloses [including]

allocating said pre-selected memory amounts to generally equal the total amount of pre-event and post-event video corresponding to said preset durations (Refer to Figure 3, numeral 222, specifically numeral 400).

Regarding Claim 34: Wolff discloses [including] the steps of

selecting errors requiring trigger signals,

assigning sensors to detect the selected errors, and

associating certain video cameras with said selected errors at predetermined area of the operating machinery required to adequately video events surrounding the trigger signals (Refer to Figure 3, numeral 222, specifically numeral 400, It should be noted that all of these steps can be user defined function that can be established by a pre-disclosed computer code/software associated with the errors observed for multiple usage in various forms of image analysis).

Regarding Claim 35: Wolff discloses [including] receiving said sensor signals at the machine controller for the machinery, and simultaneously transmitting said sensor signals over a local area network to said computer processor ("Referring again to FIG. 2, the communication interface 232 is shown operatively connected to other devices such as a robot controller, and the like. It is contemplated that an appropriate communication interface 290 and associated drivers (serial, network, parallel, or wireless) can be provided to the controller 240." at column 16, line 25).

Regarding Claim 36: Wolff discloses [including]

discontinuing operation of said machinery in response to said trigger signal (Refer to Figure 4, numeral 406; "Within the application layer 404 is a generic application interface 406. This layer allows user instruction of possible modes of operation for the underlying application (e.g. run, stop, training, etc.), and reports to the user the current mode. A set of generic functions are located in this layer 406." at column 8, line 26).

Regarding Claim 37: Wolff discloses [including]

compressing said video output prior to transmitting said video output to said temporary memory ("In yet another illustrative embodiment, the display image is compressed by a simple algorithm to reduce transmission time. Although many sophisticated image compression methods are well-known in the art, the it is possible to provide a simpler compression method that generates a transmitted, compressed data stream more suitable for the limited processor speed and memory size of the PDA." at column 11, line 27).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 3-7, 11, 18, 19, 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. (US 6,798,928 B2) in combination with Conners et al (US 5,960,104).

Regarding Claim 3:

Iida discloses all the claimed elements as listed above.

Iida does not specifically disclose a plurality of cameras, located at monitoring zones to provide video of the trigger event.

Conners teaches [including] a plurality of said cameras (Refer to Figure 2, numeral 100 and numeral 120) located at a prescribed monitoring zone associated with a prescribed trigger signal and required to effectively provide video of the trigger event (Line Scan Cameras, 100 and 120 are located appropriately a short distance away from each other as shown by Figure 2), and said pre-event and post-event videos containing video output from each of said cameras

(Line Scan Camera 100, would be associated with the "pre-event video" and Line Scan Camera 120, would be associated with the "post-event video" as demonstrated at Figure 2).

Iida and Conners are combinable because they are in the same field of endeavor, machine vision and manufacturing and product inspection.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to utilize a plurality of cameras associated with a trigger signal in a machine vision manufacturing inspection process to record pre and post event videos.

The suggestion/motivation for this combination would be the ability of the system to be able to record continuous and while evaluating video at shortened time intervals before the inspection and in shortened time intervals after the inspection.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the plurality of cameras located at different monitoring zones as disclosed by Iida with the video system having machinery that detects errors as taught by Conners to obtain the invention as described and claimed at claim 3.

Regarding Claim 4: Conners teaches wherein said machinery includes a programmed logic controller (PLC) receiving said sensor signals for controlling normal machinery operation in response to said sensor signals (Refer to Figure 1, numeral 214 and 216),
and said processor being in communication with said PLC to simultaneously receive and process said sensor signals for generating said trigger signal corresponding to a prescribed

trigger event in machinery operation represented by one or more of said sensor signals (Refer to Figure 2b; "A manual switch box 280 is connected to all of computers 230, 232, and 234, which allows one mouse 282, one keyboard 284 and one monitor 286 to be I/O devices for any of the three computers 230, 232, or 234 described above." at column 17, line 16).

Regarding Claim 5: Conners teaches [where] said processor is set up to produce said trigger signal in response to a combination of two or more of said sensor signals ("...a fourth unique feature of this invention is that it utilizes redundant information from the set of multiple sensors. This redundancy is utilized in this invention to improve system accuracy. Of the existing multiple sensor systems described above, only those systems that use an x-ray scanner and a profiler generate redundant data. The concept of redundant data is based on the fact that the information obtained by the x-ray scanner is dependent on shape (in the case of logs) or thickness (in the case of boards). Hence, considering the shape or the thickness of an object helps in understanding the data generated by the x-ray scanner." at column 10, line 62).

Regarding Claim 6: Conners teaches [including] a local area network (LAN) connecting said machine PLC to said control unit processor for concurrent transmission of a plurality of machine sensor signals received by said PLC from said sensors (As shown at Figure 2a, numeral 254; "an Ethernet card 254").

Regarding Claim 7: Conners teaches wherein said LAN includes an Ethernet, and said machine PLC includes a converter for converting said sensor signals for transmission over said Ethernet. ("The Ethernet cards 254 of both computers 230 and 232 are used to transmit and receive information from the integrated evaluation and control computer 234 through the

Ethernet card 254 of the computer 234." at column 16, line 35, further at column 16, lines 12-27).

Regarding Claim 11: Conners discloses [wherein said] computer program includes set-up instructions for selecting a first preset duration for said pre-event video and a second preset duration for a said post-event video ("The information from the controllers 214, 216, 220, and 222 in the VME card cage 210 are variously sent to two different computers 230 and 232, each of which is identically configured and runs the same setup and analysis software." at column 16, line 12), selecting one or more machine sensor signals required to generate said trigger signal ("As can be seen in FIG. 2, the analog signals from all the sensing systems 40, 42, 70, 90, and 92 are all directed to a VME based card cage 210 that contains the power supply 212 that powers all the sensors and their controllers..." at column 15, line 63), and selecting one or more cameras producing the pre-event and post-event videos for the trigger event ("the two color camera controllers 214 and 216 that control each of the two color cameras 100 and 120 and that digitizes the analog output of each of cameras 100 and 120..." at column 15, line 66).

Regarding Claim 18: Iida discloses a diagnostic system for assisting in the diagnosis of a malfunction and other errors in a manufacturing process implemented by an operating machine having a plurality of machine sensors located at machine monitoring zones for detecting errors at said zones and generating sensor signals representing said errors, and a programmed logic controller (PLC) receiving said sensor signals for controlling the machinery operation in response to said sensor signals ("It is an object of the present invention to provide an image recording apparatus which makes it possible to connect and store related data (image data,

inspection data corresponding to inspection results) for identifying the cause of the generation of nonconforming products." at column 2, line 15-19), said system comprising:

a central control unit having a computer processor in communication with a computer readable medium having a permanent memory (Refer to Figure 3, numeral 12 and 12c, respectively);

a temporary computer memory in communication with said processor (Refer to Figure 3, numeral 12h);

and a set of computer readable instructions embodied within said computer readable medium executable by said processor including: set-up instructions for receiving input selecting a first preset duration for a pre-event video and a second preset duration for a post-event video from said video cameras, receiving input selecting one or more machine sensor signals required to generate trigger signals triggering production of the pre-event video and post-event video, and receiving input selecting one or more cameras producing the pre-event and post-event videos for each trigger signal, and operating instructions executable by said processor for continuously storing video output in said temporary memory depicting machinery operation from said cameras, ("While making suitable use of a main memory 12c, this CPU 12a carries out prescribed processes and the like related to the present invention based on process programs, parameters and the like stored in a ROM 12b. In this regard, the actual process method will be described below. Further, the ROM 12b is constructed from a nonvolatile memory such as a EPROM, DTPROM or the like." at column 4, line 60).

continuously receiving available sensor signals (Refer to Figure 2b, numeral 280 in communication with the three processors), processing said sensor signals to determine if a trigger signal is required (Refer to Figure 3, numerals 230, 232, and 234), continuing the

preceding operating instructions if a trigger signal is not required (Refer to Figure 3, "Communications"), and upon occurrence of a trigger signal copying video from said temporary memory into said permanent memory of said first preset duration to provide said pre-event video and beginning the recording of said post-event video and storing said post-event video in said permanent memory after said second preset duration has expired (Refer to Figure 3, numeral 234).

Iida does not specifically disclose a plurality of cameras, located at monitoring zones to provide video of the trigger event with specific sensors at said monitoring zones, and a processor in communication with said cameras for receiving video output depicting the operation of the manufacturing process;

Conners teaches [including] a plurality of said cameras (Refer to Figure 2, numeral 100 and numeral 120) located at a prescribed monitoring zone associated with a prescribed trigger signal and required to effectively provide video of the trigger event (Line Scan Cameras, 100 and 120 are located appropriately a short distance away from each other as shown by Figure 2), and said pre-event and post-event videos containing video output from each of said cameras (Line Scan Camera 100, would be associated with the "pre-event video" and Line Scan Camera 120, would be associated with the "post-event video" as demonstrated at Figure 2); processor in communication with said cameras for receiving video output depicting the operation of the manufacturing process (By way of "Switch Box", numeral 280 at Figure 2b, all the processors are in connection with the specific sensors at each monitoring zone. See Figure 2a for a more detailed example.)

Iida and Conners are combinable because they are in the same field of endeavor, machine vision and manufacturing and product inspection.

At the time that the invention was made, it would have been obvious to one of ordinary skill in the art to utilize a plurality of cameras located at a prescribed monitoring zone associated with a prescribed trigger signal and required to effectively provide video of the trigger event and said pre-event and post-event videos containing video output from each of said cameras and a processor in communication with said cameras for receiving video output depicting the operation of the manufacturing process.

The suggestion/motivation for this combination would be the ability of the system to be able to record continuous and while evaluating video at shortened time intervals before the inspection and in shortened time intervals after the inspection.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the plurality of cameras located at different monitoring zones associated with a prescribed trigger signal and required to effectively provide video of the trigger event and said pre-event and post-event videos containing video output from each of said cameras and a processor in communication with said cameras for receiving video output depicting the operation of the manufacturing process as disclosed by Iida with the video system having machinery that detects errors as taught by Conners to obtain the invention as described and claimed at claim 18.

Regarding Claim 19: Iida discloses wherein said operating instructions include instructions for storing said pre-event and post-event videos in a video file in said permanent memory along

with a trigger name associated with said trigger signal, and time and date information so that video output before and after the trigger event can be displayed and reviewed to assist in the diagnosis of the trigger event ("...this CPU 12a carries out prescribed processes and the like related to the present invention based on process programs, parameters and the like stored in a ROM 12b. In this regard, the actual process method will be described below. Further, the ROM 12b is constructed from a nonvolatile memory such as a EPROM, DTPROM or the like." at column 4, line 60; Also as shown at Figure 8, the video file can be written to the Flash Memory which can also house the trigger name, time and date information to be displayed).

Regarding Claim 21: Iida discloses wherein said operating instructions include instructions for generating trigger signals and recording the time, date, and location of the trigger event upon occurrence of a trigger signal, storing said pre-event video and said post-event video according to said first preset duration and said second preset duration, respectively, in response to said trigger signal, and upon occurrence of said trigger signal copying video from said temporary memory to said permanent memory of said first preset duration to provide said pre-event video ("...wherein the control means is equipped with an initialization function to establish relative position data from the prescribed signal at the time when image data is being stored in the storage means based on the reception of an input which determines whether or not the displayed image should be stored in the storage means. In this way, because the relative position can be obtained visually, initialization can be carried out easily." at column 3, line 5).

Regarding Claim 22: Iida discloses wherein said operating instructions include instructions for storing said post-event video in said temporary memory containing said pre-event video and copying said pre-event and post-event videos into a video file in said permanent memory (As

shown at Figure 8; "Namely, in the case where a flash memory write in operation is not being carried out at the time a recording execution event occurs (see A, D in FIG. 8), all the data is copied (stored) in the flash memory, and in the case where a flash memory write in operation is being carried out at the time a recording execution event occurs (see B, C in FIG. 8), data omitting the image data is stored." at column 8, line 42).

Regarding Claim 23: Iida discloses wherein said operating instructions include display instructions continuously displaying the video on a display screen in real time concurrently with said video being stored in said temporary memory ("The image compression engine 12f carries out real-time compression/expansion of the acquired image data for each field unit. Accordingly, the digital converted image data received from the video interface 12e is compressed and then sent to the CPU 12a. Further, the image data for output display acquired from the CPU 12a and the like is expanded by the image compression engine 12f and then transferred to the video interface 12e." at column 5, line 21).

Regarding Claim 24: Iida discloses including compression chips individually associated with said video cameras in the system for compressing the video output of said cameras prior to transmitting the video output to the processor (Refer to Figure 3, numeral 12f, then being coupled simultaneously to personal computer, numeral 16 via communication numeral 12j).

Regarding Claim 25: Conners discloses a computerized method for assisting in the diagnosis of malfunction and other errors occurring in the operation of manufacturing machinery where machine sensors are strategically placed at machinery monitoring zones prone to malfunction ("An x-ray scanning system is employed to detect internal features. The system is able to

process material in a species-independent manner by using a histogram-based segmentation procedure for analyzing both the camera imagery and the x-ray imagery; and can detect small defects by removing the effects of large features from the histograms once they have been detected." at abstract), said method comprising;

selecting specific errors which need to be detected in order to define trigger events at the monitoring zones requiring generation of trigger signals ("The present invention achieves this object in a number of ways. First, it incorporates all the sensors needed to address the surface feature detection problem, the three-dimensional shape detection problem, and the internal feature detection problem. To detect surface features this invention employs two color cameras, one for imaging each of the major faces of a board, lineal, cant, or flitch. To address the three-dimensional shape detection problem this system employs a high speed laser profiling device. This device can detect not only wane, but also areas which are too thin. Lastly, it employs an x-ray scanning system to detect internal features." at column 10, line 12);

assigning a number of sensors at the monitoring zones required to detect the occurrence of a trigger event ("While it is known that multiple sensors are needed to gauge all information required to address the general board, lineal, cant, or flitch inspection problems, each new sensor increases the volume of data that must be analyzed." at column 11, line 33);

associating a number of video cameras with trigger events and sensors at said monitoring zones having video output sufficient to effectively diagnose errors occurring at the monitoring zones (Refer to Figure 2, numerals 100, 120, 44a, 44b, 54a and 54b);

continuously storing the video output in real time in a temporary computer memory during operation of the machinery (Refer to Figure 2b, numeral 244);

continuously displaying the video output on a display monitor in real time while simultaneously storing the video output (Refer to Figure 2b, numeral 286);

producing a pre-event video from video output stored in the temporary memory upon occurrence of said trigger signal depicting machinery operation occurring before said trigger signal (Refer to the video recorded after the Line Scan Camera, numeral 100 is captured);

producing a post-event video upon occurrence of the trigger signal depicting machinery operation occurring after said trigger signal (Refer to the video recorded after the Line Scan Camera, numeral 120 is captured);;

and storing said pre-event video and post-event video in a video file in a permanent computer memory of a computer readable medium along with text information identifying the trigger event (Refer to Figure 3, numeral 402, communicated and stored at the "Master Computer Main Program").

Regarding Claim 26: Conners discloses [including] storing said post-event video in said temporary computer memory containing said pre-event video upon occurrence of said trigger signal (Refer to the video recorded at Figure 2, numeral 100, and 120; The pre/post event video's are automatically stored by the temporary computer memory is stored), and saving said pre-event and post-event video from said temporary memory in said permanent memory after said post-event video is completed (Further at Figure 2b, the pre/post event video's are stored to memory, which can be associated with a non-volatile device coupled to the processor as shown at Figure 2b).

Regarding Claim 27: Iida teaches [including] compressing said video output prior to transmitting said video output to said temporary memory (Refer to Figure 3, numeral 12f).

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. (US 6,798,928 B2) in combination Conners et al (US 5,960,104) and further in view of Thompson (US 7,068,301 B2)

Regarding Claim 20:

Iida and Conners disclose all the claimed elements as listed above.

Iida and Conners does not specifically disclose [said] set-up instruction includes instructions for receiving input selecting names for trigger events corresponding to selected errors in machinery operation.

Thompson teaches [wherein said] set-up instruction includes instructions for receiving input selecting names for trigger events corresponding to selected errors in machinery operation ("The inspector 50, after obtaining the data, may record additional data, such as notes regarding the condition of the engine, the serial number of the engine, the date of inspection, the aircraft tail number or other identifier, the inspector's name, etc. This can be performed using a user interface 36 (FIG. 1) or the apparatus 20, which can be a keyboard, touch screen or any suitable interfaces as will be described below. The inspector 50 may also recall previously stored information regarding the engine, such as the aforementioned initial condition 39, historical information 40, diagnostic information 42 or instructional information, 44 and determine a course of action." at column 6, line 60).

Iida, Conners and Thompson are combinable because they are in the same field of obtaining, recording, displaying, storing and transmitting image analysis information.

At the time that the invention was made, it would have been obvious to a person of ordinary skill in the art to provide set-up instructions for receiving selected names for trigger events.

The suggestion/motivation for this combination would be to create a more efficient database/log history to prevent further calculation errors in future detection and diagnostic processing. Additionally, by naming the trigger events, multiple users can access the diagnostic results without confusion or doubt as to what the analysis of the said errors are presently or have been in the past.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iida et al. (US 6,798,928 B2) in combination Thompson (US 7,068,301 B2)

Regarding Claim 16:

Iida discloses all the claimed elements as listed above.

Iida does not specifically disclose that the display monitor includes a touch screen input for inputting data and information into the processor.

Thompson teaches [wherein] said display monitor includes a touch screen input for inputting data and information into said processor ("The system includes an apparatus having an LCD, a touch panel..." at column 3, line 19; "Once the pictures and data are captured and stored, they may be down loaded to other computers and or transmitted via the Internet or other transport methods." at column 3, line 37).

Iida and Thompson are combinable because they are used for in the same field of obtaining, recording, displaying, storing and transmitting image analysis information.

At the time that the invention was made, it would have been obvious to a person of ordinary skill in the art to add a touch screen input for information analysis to a processor.

The suggestion/motivation for adding the claimed element of Thompson with Iida would be to allow the "inspector" to record additional data that may not be observed by the machine vision inspection software. The "inspector" can make additional notes, regarding the overall condition of the image and create serial numbers based on the number of inspections performed.

Therefore, it would have been obvious to one of ordinary skill in the art to combine the touch screen of Thompson with the system as disclosed by Iida to obtain the invention of claim 16.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is 571-270-1583. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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VIKKRAM BALI
PRIMARY EXAMINER